SEQUENCE LISTING

<110> Dulac, Catherine
Axel, Richard

<120> Cloning Of Vertebrate Pheromone Receptors And Uses Thereof

<130> 0575/48557A/JPW/ADM

<140>
<141>

<150> 08/731,745
<151> 1996-10-18

<160> 21

<170> PatentIn Ver. 2.1

<210> 1
<211> 530
<212> DNA
<213> Homo sapiens

<400> 1
aaacataagt ccagttatct acaggtacag gttgatgaga ggcctctcca tttccaccac 60
ctgcctgttg agtgtcctcc aggccatcaa cctcacccca aggagctccc gtttggcaat 120
gttcagagat cctcacatca caaaccgcgt tgctttctct tgctgtgggt cttccacata 180
tccattagtg gaagcttctt agtctccact cttccctcca aaaatgttgc ctcaaatagt 240
gttacatttg tcactcaatc ctgctctgct gggcccctga gttgcttcct tgggcagaca 300
attttcacac tgatgacatt tcaggatgtc tccttgcagc tcatggcccc cttcagtgga 360
tacatggtga ttctcttgtg caggcataac aggcagtctc agcatcttca tagtatcaac 420
ctttctccaa aagcaccccc agataaaagg gccatccaga gcattctttt gctcgtgagt 480
ttctttgtgt tcatgtgcct tttcccattt gctgccttaa cacttctgtc 530

<210> 2
<211> 1385
<212> DNA
<213> Rattus sp.

<400> 2
tttcggcacg agttcacctg ccctcgaatt tcaatttgag taagtgacca gcaatggagt 60
acagaatcag aagatggttg gatcccaggc aggctgtggg aggaggaact ctggaactgc 120
atgaggagtt tgagcacctg ccatggagta gctgatctct gaggacccct cacacaggtc 180
ctgtgttcta catcaagtgc atatttttcc taggatattc atttccgtaa gtcctgaaat 240
tacttaattt ttataggagt tctcatatat gatgaataag aacagcagac tctacactga 300

ttctaacata aggaatacct ttttcgctga aattggcatt ggagtctcag ccaatagcct 360
cctacttctc ttcaacatct tcaagttaat ttgtgggcag aggtccagac tcactgacct 420
gcccattggt ctcttgtccc taatcaactt acttatgcta ctgatgacgg cattcatagc 480
cacagacact tttatttctt ggagagggtg ggatgacatc atatgtaaat cccttctcta 540
cctgtacaga acttttagag gtctctctct ttgtaccagc tgcctgttga gtgtcctgca 600
ggccatcatc ctcagtccca gaagctcctg tttagcaaag ttcaaacata agccttccca 660
tcacatctcc tgtgccattc tttctctgag tgtcctctac atgttcatta gcagtcacct 720
cttagtatcc atcattgcca ccccaaattt gaccacgaat gactttattc atgttactca 780
gtggtgctct attctaccca tgagttacct catgcaaagc atgttttcta cactgctggc 840
catcagggat gtctttctta ttagtctcat ggtcctgtca acatggtaca tggtggctct 900
cttgtgtagg cacaggaaac agacccggca tcttcagggt accagccttt ccccaaaagc 960
atccccagaa caaagggcca cccgttccat cctgatgctc atgagcttat ttgttctgat 1020
gtctgtcttt gacagcattg tctgcagctc aagaactatg tatctgaatg atccaatatc 1080
ttattcttat caactattta tggtgcacat ctatgccaca gtaagccctt ttgtgtttat 1140
tgtcactgaa aaacatatag ttaactcttt gaggtccatg tgtgtgaagg tgcatgaatg 1200
tttgaatatt ccttgatagc aagctccatt aagaggagcc aatgtaagca tcagaactgt 1260
caatcatggc gtgctatgtg ctttggcata tgtgaaatat gaagttgttt ttctgttaaa 1320
atgatttact ttaactgacg agatgatgaa cgtaacagaa gattaaacca catccccttt 1380
gatat 1385

<210> 3
<211> 1331
<212> DNA
<213> Rattus sp.

<400> 3
gtggatcccc cgggctgcag gaattcggca cgagccgtga ttaagggact ttgaactttt 60
caagggattt ggagttttat gaagaatttg aagatttaca gagtttacag gaatggagct 120
gaccagccac tatgacatgc cttatatctc caagagcata aatataaggc atggcatgag 180
aggaccagca gccactgttc tcatatatga tgaataagaa cagcagagtc cacactgatt 240
ctaccataag gaataccttc tccactgaaa ttggcattgg aatcttagcc aacagtttcc 300
tacttctctt ccacatcttc aagtttattc gtggacagag gtccagactc actgacctgc 360
ccattggtct cttgtcccta atccacctac tgatgctact gatgggggca ttcatagcca 420
tagacatttt tatttcttgg aggggatggg atgacatcat atgtaaattc cttgtctact 480
tgtacagaag ttttagaggt ctctctcttt gtaccacctg catgttgagt gtcctgcagg 540
ccatcaccct cagccccaga agctcctgtt tagcaaagtt caaacataag tctccccatc 600
acgtctcctg tgccattatt tcgctgagca tcctctacat gttcattagc agtcacctct 660
tagtatccat caatgccacc cccaatttga ccacgaacaa ctttatgcaa gttactcagt 720
cctgctacat tataccctg agttacctca tgcaaagcat gttttctaca cttctggcca 780
tcagagatat ctctcttatt agtctcatgg tcctctcgac ttgttacatg gaggttctct 840
tgtgtaggca caggaatcag atccagcatc ttcaagggac caacctttcc ccaaaagcat 900
ctccagaaca aagggccaca cagaccatcc tgatgctcat gaccttcttt gtcctaatgt 960
ccattttcga cagcattgtc tcctgttcaa gaactatgta tctgaatgat ccaacatctt 1020
actatattca aatatttgta gtggacatct atgccacagt cagccctttt gtgtttatga 1080
gcactggaaa acatatagtt aacttttga agtccatgtg tgtgagggtg aagaatgttt 1140
gaatattcat taatggacaa gatcctttaa gaggagccaa tgtagtcatc agaactgtca 1200
gtcatggtgt gctgtctatg tgctttggta aatgtgaatc atgaagttgt ttttctggta 1260

aaatgattta ctttaaccaa ctcatgattg taaacatgta acaggagatt aaacaatatc 1320
cccttcggaa a 1331

<210> 4
<211> 1496
<212> DNA
<213> Rattus sp.

<400> 4
aattcggcac gagcaaaggc agggaagatg ctccactggg atgtcatgtc tctatgctcc 60
acagtggaaa agttgtcaca ttgtacaaac actaaaatta cgaattgctc acaggcacta 120
aaagcttcct taatcctgtg caggatctcc tcaggtacag agtcctcctg atacgtctat 180
ctggtcagag gaaagagctg atcagtcatt aacagagctg atttggtccc tccaaggtca 240
catgacaagg actgtatgag aaaaccagca gtgacatgtc tatagagatc attctgtgcc 300
acacccagct ccatgtttgg tttgtggtat ttgcttccta tccacataca atgaataaag 360
acaacacact ccatgttgac acaatcatga aaatcactat gttctctgaa gtgagtgttg 420
gcatcttagc taacagtatc ctgtttttg gtcacctgtg catgctcctt ggagagaaca 480
agcctaagcc cattcatctc tacattgcat ccttgtccct aacacaacta atgctgctta 540
taactatggg actcatagct gctgacatgt ttatttctca ggggatatgg gattctacct 600
catgccagtc ccttatctat ttgcacaggc tttcgagggg ttttaccctt agtgctgcct 660
gtctgctgaa tgtcttttgg atgatcactc tcagttctaa aaaatcctgt ttaacaaagt 720
ttaaacataa ctctccccat cacatctcag gtgccttttct tctcctctgt gttctctaca 780
tgtgttttag cagtcacctt attttatcga ttattgctac ccctaacttg acctcagata 840
attttatgta tgttactaag tcctgttcat ttctacccat gtgttactcc agaacaagca 900
tgttttccac aacaattgct gtcagggaag cctttttttat cggtctcatg gccctgtcca 960
gtgggtacct ggtggctttc ctctggagac acaggaagca ggcccagcat cttcacagca 1020
ccggcctttc ttcaaagtca tctccagagc aaagggccac cgagaccatc ctgctgctta 1080
tgagtttctt tgtggttctc tacattttgg aaaatgttgt cttctactca aggatgaagt 1140
tcaaggatgg gtcaacattc tactgtgtcc aaattattgt gtcccatagc tatgccactg 1200
tcagctcttt tgtgtttatt ttcactgaaa agcgtatgac taagatattg aggtcagtgt 1260
gtgccagaat aataaataat tgattattca gtgatgggta ttgcccctta gaataaacca 1320
ttacgttgtc atcagaggtt tgggtcatga cataattggg acattctctg tcttaaattg 1380
ataaatgaaa ttttcttttt tcctgttaaa actgtttcct ttgtgtgtgg atgcccaata 1440
tatgaaagaa aactaaacac catgtcctct tacatatcca accaaaaaaa aaaaaa 1496

<210> 5
<211> 1053
<212> DNA
<213> Rattus sp.

<400> 5
ttttttccca cctcttcatg ctctttgaaa agaacagatc taagcccatt gatctctaca 60
ttgctttctt atccttaacc caactaatgc tgcttataac tattggactt atagctgcag 120
acatgtttat gtctcggggg agatgggatt ctaccacatg ccagtccctt atctatttgg 180
acaggctttt gaggggtttt acccttttgtg ctacctgtct gctgaatgtc ctttggacca 240
tcactctcag tcctagaagc tcctgtttaa caacatttaa acataaatct ccccatcaca 300

tctcaggtgc ctttcttttc ttctgtgttc tctatatatc ttttggcagt cacctctttt 360
tatcaacaat tgctaccccc aatttgactt cagataattt tatgtatgtt actaaatcct 420
gttcatttct acccatgagt tactccagaa caagcatgtt ttccacacca atggccatca 480
gggaagccct tcttattggt ctcattggcc tgtccagtgg gtacatggtt gctttcctat 540
ggagacacaa gaatcaggcc cggcatcttc acagcaccag cctttcttca aaagtgtccc 600
cagagcaaag ggccaccagg accatcatga ttctcatgag cttctttgtg gttctctaca 660
ttttggaaaa tgttgtcttc tactctagga tgacattcaa ggatgggtca atgttctact 720
gtgtccaaat tattgtgtcc catagctatg ccaccatcag cccttttgtg tttatttgca 780
cagaaaagcg tataattaaa ctttgggggt caatgtctag cagaatagta agtatttgat 840
tactcagtga tggatatggt cccttaatat aaaccaatat gttgtcataa taactatgga 900
tcatgacata ttggggacat tctgtgtctt aaatttataa aaaaaatttt cttttttttgt 960
gtttaatctg tttcccttgt gtgtggatga taagtatata aagggaaatt aaacagcgtg 1020
tcccctcaga tatccaaaaa aaaaaaaaaa aaa 1053

<210> 6
<211> 1538
<212> DNA
<213> Rattus sp.

<400> 6
gggctgcagg aattcggcac gagtcagagt ccttccctgc tatgtgtatc tggagccagc 60
gactcttcta tggagagcag ctgtgcaggc aggtggtgga gcggaagaag gcgtgctgct 120
gtgacatcat caagatgctg cctagccctg cgtcgctgct cttctgagga agcaggagac 180
tgacccctgt gacaatgact tgatgagtca ctctgttgtc tacttaccct agttctttgt 240
cccatacaat gaggagaatc agcacactgt atggagttgt tgacaagcaa gctatatttt 300
tctctgaagt agtcatcggg atctcattca acagtatcct cttcctcttc cacatctttc 360
agttccttct tgagcgtagg ctccggatca ctgacctgat catcagtctc ttggccctca 420
tccaccttgg gatgctaaca gtcatgggat tcagagctgt tgatattttt gcatctcaga 480
atgtgtggaa tgacatcaaa tgcaaatccc ttgcccactt acacagactt ttgaggggcc 540
tctctctttg tgctacctgt ctgctgagta tcttccaggc catcaccctt agccccagaa 600
gctcctgttt agcaaagttc aaatataaat ccacacagca cagcctgtgt tcccttcttg 660
tgctctgggc cttctacatg tcctgtggta ctcactactc cttcaccatc gttgctgact 720
acaacttctc ttcacgcagt ctcatatttg tcactgaatc ctgcattatt ttacccatgg 780
attacatcac cagggattta tttttcatat tggggatatt tcgggatgtg tccttcatag 840
gtctcatggc cctctccagc gggtacatgg tggccctctt gtgcagacac aggaaacagg 900
cccagcatct tcacaggacc agcctttctc caaaagcatc cccagagcaa agggccacca 960
ggaccatcct gttgctcatg agcttctttg tgttgatgta ctgcttggac tgcaccatat 1020
ccgcctccag acttatgcac aacggtgaac caatccacca cagtattcag atgatggtct 1080
ccaatagcta tgccaccctc agccctttgc tgttaattgt tactgaaaat cgaattagta 1140
ggtttttgaa gtccttgcta ggaaggacag tagatgctta agtattgagg ggaggcaggc 1200
ccactaaagg agccaatatg ctagctactg aataatgaat cctggcctag tcctcatgca 1260
atcctgaaca aattaataca tgactcatgc ttcgttaaac ctgcttcttt tgaaatgtgt 1320
attaccaaca cctgtagata tttgagtcaa atttcttcat gtgtatttct tctcagtgtc 1380
agtaggggac atctgtgaca ctttcacaga ttagggtaac ttgtgcactt atcaataagc 1440
taaagtgtac agcacatttt actaagccaa ttatctcaac agtttgtttt ctacccaatt 1500
aaatatgtaa atgttaccac caaaaaaaaa aaaaaaa 1538

<210> 7
<211> 1264
<212> DNA
<213> Rattus sp.

<400> 7
ttggggtaaa acggctcgat gacttccaca tgttttgcca tggcagaatc tgctccatgc 60
gggacaagaa aatctctttt ctggtctgac gggcttactg ctgaattcac tgtcggcgaa 120
ggtaagttga tgactcatga tgaaccctgt tctatggctc cagatgacaa acatgatctc 180
atatcaggga cttgttcgca ccttccctaa cagtatcctg ttttttgccc acctctgcat 240
gttctttgaa gagaacaggt ctaagcccat tgatctgtgc attgctttct tatccttaac 300
ccaactaatg ctgcttgtaa ctatgggact catagctgca gacatgttta tggctcaggg 360
gatatgggat attaccacat gcaggtccct tatctatttt cacagacttt tgaggggttt 420
caacctttgt gctgcctgtc tactgcatat cctttggacc ttcactctca gtcctagaag 480
ctcctgttta acaaagttta aacataaatc tccccatcac atctcaggtg cctatctttt 540
cttctgtgtt ctctatatgt cctttagcag tcacctcttt gtattggtca ttgctacctc 600
caatttaacc tcagatcatt ttatgtatgt tactcagtcc tgctcacttc tacccatgag 660
ttactccaga acaagcacgt tttccttact gatggtcacc agggaagtct ttcttatcag 720
tctcatggcc ctgtccagtg ggtacatggt gactctccta tggaggcaca agaagcaggc 780
ccagcatctt cacagcacca gactttcttc aaaagcatcc ccacagcaaa gggccaccag 840
gaccatcctg ctgcttatga ccttctttgt ggttttctac attttaggca ctgttatctt 900
ccactcaagg actaagttca aggatgggtc aatcttctac tgtgtccaaa ttattgtgtc 960
ccatagctat gccactatca gcccatttgt gtttgttttt tctgaaaagc gcataatcaa 1020
gtttttaga tcaatgtgtg gcagaatagt aaatacttga ttattcactg atgagtatgg 1080
gtcatgaata tagtctagta aattgtgatc agagttatgg ctcatgacat attaaaaaca 1140
ttctctaatt taagtttaac atataaaatt atcttatttc tcttaaatgt gtttactttg 1200
tgtgtattaa aagtatgtaa aagataatta atccccaaat acacctttt ttcaaattaa 1260
aaaa 1264

<210> 8
<211> 315
<212> PRT
<213> Rattus sp.

<400> 8
Met Met Asn Lys Asn Ser Arg Leu Tyr Thr Asp Ser Asn Ile Arg Asn
1 5 10 15

Thr Phe Phe Ala Glu Ile Gly Ile Gly Val Ser Ala Asn Ser Leu Leu
20 25 30

Leu Leu Phe Asn Ile Phe Lys Leu Ile Cys Gly Gln Arg Ser Arg Leu
35 40 45

Thr Asp Leu Pro Ile Gly Leu Leu Ser Leu Ile Asn Leu Leu Met Leu
50 55 60

Leu Met Thr Ala Phe Ile Ala Thr Asp Thr Phe Ile Ser Trp Arg Gly
65 70 75 80

Trp Asp Asp Ile Ile Cys Lys Ser Leu Leu Tyr Leu Tyr Arg Thr Phe
85 90 95

Arg Gly Leu Ser Leu Cys Thr Ser Cys Leu Leu Ser Val Leu Gln Ala
100 105 110

Ile Ile Leu Ser Pro Arg Ser Ser Cys Leu Ala Lys Phe Lys His Lys
115 120 125

Pro Ser His His Ile Ser Cys Ala Ile Leu Ser Leu Ser Val Leu Tyr
130 135 140

Met Phe Ile Ser Ser His Leu Leu Val Ser Ile Ile Ala Thr Pro Asn
145 150 155 160

Leu Thr Thr Asn Asp Phe Ile His Val Thr Gln Trp Cys Ser Ile Leu
165 170 175

Pro Met Ser Tyr Leu Met Gln Ser Met Phe Ser Thr Leu Leu Ala Ile
180 185 190

Arg Asp Val Phe Leu Ile Ser Leu Met Val Leu Ser Thr Trp Tyr Met
195 200 205

Val Ala Leu Leu Cys Arg His Arg Lys Gln Thr Arg His Leu Gln Gly
210 215 220

Thr Ser Leu Ser Pro Lys Ala Ser Pro Glu Gln Arg Ala Thr Arg Ser
225 230 235 240

Ile Leu Met Leu Met Ser Leu Phe Val Leu Met Ser Val Phe Asp Ser
245 250 255

Ile Val Cys Ser Ser Arg Thr Met Tyr Leu Asn Asp Pro Ile Ser Tyr
260 265 270

Ser Tyr Gln Leu Phe Met Val His Ile Tyr Ala Thr Val Ser Pro Phe
275 280 285

Val Phe Ile Val Thr Glu Lys His Ile Val Asn Ser Leu Arg Ser Met
290 295 300

Cys Val Lys Val His Glu Cys Leu Asn Ile Pro
305 310 315

```
<210> 9
<211> 311
<212> PRT
<213> Rattus sp.

<400> 9
Met Met Asn Lys Asn Ser Arg Leu His Ile Asp Ser Asn Ile Arg Asn
1               5                   10                  15

Thr Phe Phe Thr Glu Ile Gly Ile Gly Val Ser Ala Asn Ser Leu Leu
            20                  25                  30

Leu Leu Phe Asn Ile Phe Lys Phe Ile His Gly Gln Arg Ser Arg Leu
        35                  40                  45

Thr Asp Leu Pro Ile Gly Leu Leu Ser Leu Ile Asn Leu Leu Met Leu
    50                  55                  60

Leu Ile Met Ala Cys Ile Ala Thr Asp Ile Phe Ile Ser Cys Arg Arg
65                  70                  75                  80

Trp Asp Asp Ile Ile Cys Lys Ser Leu Leu Tyr Leu Tyr Arg Thr Phe
                85                  90                  95

Arg Gly Leu Ser Leu Ser Thr Thr Cys Leu Leu Ser Val Leu Gln Ala
            100                 105                 110

Ile Ile Leu Ser Pro Arg Ser Ser Cys Leu Ala Lys Tyr Lys His Lys
        115                 120                 125

Pro Pro His His Ile Phe Cys Ala Met Leu Phe Leu Ser Val Leu Tyr
    130                 135                 140

Met Phe Ile Ser Ser His Leu Leu Leu Ser Ile Ile Ala Thr Pro Asn
145                 150                 155                 160

Leu Thr Thr Asn Asp Phe Ile His Val Ser Gln Ser Cys Ser Ile Leu
                165                 170                 175

Pro Met Ser Tyr Leu Met Gln Ser Met Phe Ser Thr Leu Leu Ala Ile
            180                 185                 190

Arg Asn Val Phe Leu Ile Ser Leu Ile Val Leu Ser Thr Trp Tyr Met
        195                 200                 205

Val Ala Leu Leu Cys Arg His Arg Lys Gln Thr Arg His Leu Gln Asp
```

210 215 220

Thr Ser Leu Ser Arg Lys Ala Ser Pro Glu Gln Arg Ala Thr Arg Ser
225 230 235 240

Ile Leu Met Leu Arg Ser Leu Phe Gly Leu Met Ser Ile Phe Asp Ser
245 250 255

Ile Ala Ser Cys Ser Arg Thr Met Tyr Leu Asn Asp Pro Thr Ser Tyr
260 265 270

Ser Ile Gln Leu Leu Val Val His Ile Tyr Ala Thr Val Ser Pro Phe
275 280 285

Val Phe Met Ile Thr Glu Lys His Ile Val Asn Tyr Leu Lys Ser Met
290 295 300

Tyr Val Arg Val Leu Asn Val
305 310

<210> 10
<211> 311
<212> PRT
<213> Rattus sp.

<400> 10
Met Met Asn Lys Asn Ser Arg Val His Thr Asp Ser Thr Ile Arg Asn
1 5 10 15

Thr Phe Ser Thr Glu Ile Gly Ile Gly Ile Leu Ala Asn Ser Phe Leu
20 25 30

Leu Leu Phe His Ile Phe Lys Phe Ile Arg Gly Gln Arg Ser Asp Leu
35 40 45

Thr Asp Leu Pro Ile Gly Leu Leu Ser Leu Ile His Leu Leu Met Leu
50 55 60

Leu Met Gly Ala Phe Ile Ala Ile Asp Ile Phe Ile Ser Trp Arg Gly
65 70 75 80

Trp Asp Asp Ile Ile Cys Lys Phe Leu Val Tyr Leu Tyr Arg Ser Phe
85 90 95

Arg Gly Leu Ser Leu Cys Thr Thr Cys Met Leu Ser Val Leu Gln Ala
100 105 110

Ile Thr Leu Ser Pro Arg Ser Ser Cys Leu Ala Lys Phe Lys His Lys
115 120 125

Ser Pro His His Val Ser Cys Ala Ile Ile Ser Leu Ser Ile Leu Tyr
130 135 140

Met Phe Ile Ser Ser His Leu Leu Val Ser Ile Asn Ala Thr Pro Asn
145 150 155 160

Leu Thr Thr Asn Asn Phe Met Gln Val Thr Gln Ser Cys Tyr Ile Ile
165 170 175

Pro Leu Ser Tyr Leu Met Gln Ser Met Phe Ser Thr Leu Leu Ala Ile
180 185 190

Arg Asp Ile Ser Leu Ile Ser Leu Met Val Leu Ser Thr Cys Tyr Met
195 200 205

Glu Val Leu Leu Cys Arg His Arg Asn Gln Ile Gln His Leu Gln Gly
210 215 220

Thr Asn Leu Ser Pro Lys Ala Ser Pro Glu Gln Arg Ala Thr Gln Thr
225 230 235 240

Ile Leu Met Leu Met Thr Phe Phe Val Leu Met Ser Ile Phe Asp Ser
245 250 255

Ile Val Ser Cys Ser Arg Thr Met Tyr Leu Asn Asp Pro Thr Ser Tyr
260 265 270

Tyr Ile Gln Ile Phe Gly Val Asp Ile Tyr Ala Thr Val Ser Pro Phe
275 280 285

Val Phe Met Ser Thr Glu Lys His Ile Val Asn Phe Leu Lys Ser Met
290 295 300

Cys Val Arg Val Lys Asn Val
305 310

<210> 11
<211> 310
<212> PRT
<213> Rattus sp.

<400> 11
Met Asn Lys Asp Asn Thr Leu His Val Asp Thr Ile Met Lys Ile Thr
1 5 10 15

Met Phe Ser Glu Val Ser Val Gly Ile Leu Ala Asn Ser Ile Leu Phe
20 25 30

Phe Gly His Leu Cys Met Leu Leu Gly Glu Asn Lys Pro Lys Pro Ile
35 40 45

His Leu Tyr Ile Ala Ser Leu Ser Leu Thr Gln Leu Met Leu Leu Ile
50 55 60

Thr Met Gly Leu Ile Ala Ala Asp Met Phe Ile Ser Gln Gly Ile Trp
65 70 75 80

Asp Ser Thr Ser Cys Gln Ser Leu Ile Tyr Leu His Arg Leu Ser Arg
85 90 95

Gly Phe Thr Leu Ser Ala Ala Cys Leu Leu Asn Val Phe Trp Met Ile
100 105 110

Thr Leu Ser Ser Lys Lys Ser Cys Leu Thr Lys Phe Lys His Asn Ser
115 120 125

Pro His His Ile Ser Gly Ala Phe Leu Leu Leu Cys Val Leu Tyr Met
130 135 140

Cys Phe Ser Ser His Leu Ile Leu Ser Ile Ile Ala Thr Pro Asn Leu
145 150 155 160

Thr Ser Asp Asn Phe Met Tyr Val Thr Lys Ser Cys Ser Phe Leu Pro
165 170 175

Met Cys Tyr Ser Arg Thr Ser Met Phe Ser Thr Thr Ile Ala Val Arg
180 185 190

Glu Ala Phe Phe Ile Gly Leu Met Ala Leu Ser Ser Gly Tyr Leu Val
195 200 205

Ala Phe Leu Trp Arg His Arg Lys Gln Ala Gln His Leu His Ser Thr
210 215 220

Gly Leu Ser Ser Lys Ser Ser Pro Glu Gln Arg Ala Thr Glu Thr Ile
225 230 235 240

Leu Leu Leu Met Ser Phe Phe Val Val Leu Tyr Ile Leu Glu Asn Val
245 250 255

Val Phe Tyr Ser Ser Arg Met Phe Lys Asp Gly Ser Thr Phe Tyr Cys
260 265 270

Val Gln Ile Ile Val Ser His Ser Tyr Ala Thr Val Ser Ser Phe Val
275 280 285

Phe Ile Phe Thr Glu Lys Arg Met Thr Lys Ile Leu Arg Ser Val Cys
290 295 300

Ala Arg Ile Ile Asn Asn
305 310

<210> 12
<211> 278
<212> PRT
<213> Rattus sp.

<400> 12
Phe Ser His Leu Phe Met Leu Phe Glu Lys Asn Arg Ser Lys Pro Ile
1 5 10 15

Asp Leu Tyr Ile Ala Phe Leu Ser Leu Thr Gln Leu Met Leu Leu Ile
20 25 30

Thr Ile Gly Leu Ile Ala Ala Asp Met Phe Met Ser Arg Gly Arg Trp
35 40 45

Asp Ser Thr Thr Cys Gln Ser Leu Ile Tyr Leu Asp Arg Leu Leu Arg
50 55 60

Gly Phe Thr Leu Cys Ala Thr Cys Leu Leu Asn Val Leu Trp Thr Ile
65 70 75 80

Thr Leu Ser Pro Arg Ser Ser Cys Leu Thr Thr Phe Lys His Lys Ser
85 90 95

Pro His His Ile Ser Gly Ala Phe Leu Phe Phe Cys Val Leu Tyr Ile
100 105 110

Ser Phe Gly Ser His Leu Phe Leu Ser Thr Ile Ala Thr Pro Asn Leu
115 120 125

Thr Ser Asp Asn Phe Met Tyr Val Thr Lys Ser Cys Ser Phe Leu Pro
130 135 140

Met Ser Tyr Ser Arg Thr Ser Met Phe Ser Thr Pro Met Ala Ile Arg
145 150 155 160

Glu Ala Leu Leu Ile Gly Leu Ile Gly Leu Ser Ser Gly Tyr Met Val

165 170 175

Ala Phe Leu Trp Arg His Lys Asn Gln Ala Arg His Leu His Ser Thr
180 185 190

Ser Leu Ser Ser Lys Val Ser Pro Glu Gln Arg Ala Thr Arg Thr Ile
195 200 205

Met Ile Leu Met Ser Phe Phe Val Val Leu Tyr Ile Leu Glu Asn Val
210 215 220

Val Phe Tyr Ser Arg Met Thr Phe Lys Asp Gly Ser Met Phe Tyr Cys
225 230 235 240

Val Gln Ile Ile Val Ser His Ser Tyr Ala Thr Ile Ser Pro Phe Val
245 250 255

Phe Ile Cys Thr Glu Lys Arg Ile Ile Lys Leu Trp Gly Ser Met Ser
260 265 270

Ser Arg Ile Val Ser Ile
275

<210> 13
<211> 310
<212> PRT
<213> Rattus sp.

<400> 13
Met Arg Arg Ile Ser Thr Leu Tyr Gly Val Val Asp Lys Gln Ala Ile
1 5 10 15

Phe Phe Ser Glu Val Val Ile Gly Ile Ser Phe Asn Ser Ile Leu Phe
20 25 30

Leu Phe His Ile Phe Gln Phe Leu Leu Glu Arg Arg Leu Arg Ile Thr
35 40 45

Asp Leu Ile Ile Ser Leu Leu Ala Leu Ile His Leu Gly Met Leu Thr
50 55 60

Val Met Gly Phe Arg Ala Val Asp Ile Phe Ala Ser Gln Asn Val Trp
65 70 75 80

Asn Asp Ile Lys Cys Lys Ser Leu Ala His Leu His Arg Leu Leu Arg
85 90 95

Gly Leu Ser Leu Cys Ala Thr Cys Leu Leu Ser Ile Phe Gln Ala Ile
            100   105   110

Thr Leu Ser Pro Arg Ser Ser Cys Leu Ala Lys Phe Lys Tyr Lys Ser
        115   120   125

Thr Gln His Ser Leu Cys Ser Leu Leu Val Leu Trp Ala Phe Tyr Met
    130   135   140

Ser Cys Gly Thr His Tyr Ser Phe Thr Ile Val Ala Asp Tyr Asn Phe
145   150   155   160

Ser Ser Arg Ser Leu Ile Phe Val Thr Glu Ser Cys Ile Ile Leu Pro
                165   170   175

Met Asp Tyr Ile Thr Arg His Leu Phe Phe Ile Leu Gly Ile Phe Arg
            180   185   190

Asp Val Ser Phe Ile Gly Leu Met Ala Leu Ser Ser Gly Tyr Met Val
        195   200   205

Ala Leu Leu Cys Arg His Arg Lys Gln Ala Gln His Leu His Arg Thr
    210   215   220

Ser Leu Ser Pro Lys Ala Ser Pro Glu Gln Arg Ala Thr Arg Thr Ile
225   230   235   240

Leu Leu Leu Met Ser Phe Phe Val Leu Met Tyr Cys Leu Asp Cys Thr
                245   250   255

Ile Ser Ala Ser Arg Leu Met His Asn Gly Glu Pro Ile His His Ser
            260   265   270

Ile Gln Met Met Val Ser Asn Ser Tyr Ala Thr Leu Ser Pro Leu Leu
        275   280   285

Leu Ile Val Thr Glu Asn Arg Ile Ser Arg Phe Leu Lys Ser Leu Leu
    290   295   300

Gly Arg Thr Val Asp Ala
305   310

<210> 14
<211> 307
<212> PRT
<213> Rattus sp.

<400> 14

Met Met Asn Pro Val Leu Trp Leu Gln Met Thr Asn Met Ile Ser Tyr
1   5   10   15

Gln Gly Leu Val Arg Thr Phe Pro Asn Ser Ile Leu Phe Phe Ala His
            20   25   30

Leu Cys Met Phe Phe Glu Glu Asn Arg Ser Lys Pro Ile Asp Leu Cys
        35   40   45

Ile Ala Phe Leu Ser Leu Thr Gln Leu Met Leu Leu Val Thr Met Gly
    50   55   60

Leu Ile Ala Ala Asp Met Phe Met Ala Gln Gly Ile Trp Asp Ile Thr
65   70   75   80

Thr Cys Arg Ser Leu Ile Tyr Phe His Arg Leu Leu Arg Gly Phe Asn
                85   90   95

Leu Cys Ala Ala Cys Leu Leu His Ile Leu Trp Thr Phe Thr Leu Ser
            100   105   110

Pro Arg Ser Ser Cys Leu Thr Lys Phe Lys His Lys Ser Pro His His
        115   120   125

Ile Ser Gly Ala Tyr Leu Phe Phe Cys Val Leu Tyr Met Ser Phe Ser
    130   135   140

Ser His Leu Phe Val Leu Val Ile Ala Thr Ser Asn Leu Thr Ser Asp
145   150   155   160

His Phe Met Tyr Val Thr Gln Ser Cys Ser Leu Leu Pro Met Ser Tyr
                165   170   175

Ser Arg Thr Ser Thr Phe Ser Leu Leu Met Val Thr Arg Glu Val Phe
            180   185   190

Leu Ile Ser Leu Met Ala Leu Ser Ser Gly Tyr Met Val Thr Leu Leu
        195   200   205

Trp Arg His Lys Lys Gln Ala Gln His Leu His Ser Thr Arg Leu Ser
    210   215   220

Ser Lys Ala Ser Pro Gln Gln Arg Ala Thr Arg Thr Ile Leu Leu Leu
225   230   235   240

Met Thr Phe Phe Val Val Phe Tyr Ile Leu Gly Thr Val Ile Phe His
                245   250   255

Ser Arg Thr Lys Phe Lys Asp Gly Ser Ile Phe Tyr Cys Val Gln Ile
260 265 270

Ile Val Ser His Ser Tyr Ala Thr Ile Ser Pro Phe Val Phe Val Phe
275 280 285

Ser Glu Lys Arg Ile Ile Lys Phe Phe Arg Ser Met Cys Gly Arg Ile
290 295 300

Val Asn Thr
305

<210> 15
<211> 173
<212> PRT
<213> Homo sapiens

<400> 15
Asn Ile Ser Pro Val Ile Tyr Arg Tyr Arg Leu Met Arg Gly Leu Ser
1 5 10 15

Ile Ser Thr Thr Cys Leu Leu Ser Val Leu Gln Ala Ile Asn Leu Thr
20 25 30

Pro Arg Ser Ser Arg Leu Ala Arg Ser Ser His His Lys Pro Arg Cys
35 40 45

Phe Leu Leu Leu Trp Val Phe His Ile Ser Ile Ser Gly Ser Phe Leu
50 55 60

Val Ser Thr Leu Pro Ser Lys Asn Val Ala Ser Asn Ser Val Thr Phe
65 70 75 80

Val Thr Gln Ser Cys Ser Ala Gly Pro Leu Ser Cys Phe Leu Gly Gln
85 90 95

Thr Ile Phe Thr Leu Met Thr Phe Gln Asp Val Ser Leu Gln Leu Met
100 105 110

Ala Pro Phe Ser Gly Tyr Met Val Ile Leu Leu Cys Arg His Asn Arg
115 120 125

Gln Ser Gln His Leu His Ser Ile Asn Leu Ser Pro Lys Ala Pro Pro
130 135 140

Asp Lys Arg Ala Ile Gln Ser Ile Leu Leu Leu Val Ser Phe Phe Val

145 150 155 160

Phe Met Cys Leu Phe Pro Phe Ala Ala Leu Thr Leu Leu
165 170

<210> 16
<211> 71
<212> PRT
<213> Rattus sp.

<400> 16
Ser Lys Arg Lys Lys Ser Phe Leu Leu Cys Ile Gly Trp Leu Ala Leu
1 5 10 15

Thr Asp Leu Val Gly Gln Leu Leu Thr Ser Pro Val Val Ile Leu Val
20 25 30

Tyr Leu Ser Gln Arg Arg Trp Glu Gln Leu Asp Pro Ser Gly Arg Leu
35 40 45

Cys Thr Phe Phe Gly Leu Thr Met Thr Val Phe Gly Leu Ser Ser Leu
50 55 60

Leu Val Ala Ser Ala Met Ala
65 70

<210> 17
<211> 74
<212> PRT
<213> Rattus sp.

<400> 17
Gly Gln Arg Ser Arg Leu Thr Asp Leu Pro Ile Gly Leu Leu Ser Leu
1 5 10 15

Ile Asn Leu Leu Met Leu Leu Ile Met Ala Cys Ile Ala Thr Asp Ile
20 25 30

Phe Ile Ser Cys Arg Arg Trp Asp Asp Ile Ile Cys Lys Ser Leu Leu
35 40 45

Tyr Leu Tyr Arg Thr Phe Arg Gly Leu Ser Leu Ser Thr Thr Cys Leu
50 55 60

Leu Ser Val Leu Gln Ala Ile Ile Leu Ser
65 70

<210> 18
<211> 174
<212> PRT
<213> Rattus sp.

<400> 18

Lys Cys Lys Ser Leu Ala His Leu His Arg Leu Leu Arg Gly Leu Ser
1 5 10 15

Leu Cys Ala Thr Cys Leu Leu Ser Ile Phe Gln Ala Ile Thr Leu Ser
20 25 30

Pro Arg Ser Ser Cys Leu Ala Lys Ser Thr Gln His Ser Leu Cys Ser
35 40 45

Leu Leu Val Leu Trp Ala Phe Tyr Met Ser Cys Gly Thr His Tyr Ser
50 55 60

Phe Thr Ile Val Ala Asp Tyr Asn Phe Ser Ser Arg Ser Leu Ile Phe
65 70 75 80

Val Thr Glu Ser Cys Ile Ile Leu Pro Met Asp Tyr Ile Thr Arg Asp
85 90 95

Leu Phe Phe Ile Leu Gly Ile Phe Arg Asp Val Ser Phe Ile Gly Leu
100 105 110

Met Ala Leu Ser Ser Gly Tyr Met Val Ala Leu Leu Cys Arg His Arg
115 120 125

Lys Gly Ala Gln His Leu His Arg Thr Ser Leu Ser Pro Lys Ala Ser
130 135 140

Pro Glu Gln Arg Ala Thr Arg Thr Ile Leu Leu Leu Met Ser Phe Phe
145 150 155 160

Val Leu Met Tyr Cys Leu Asp Cys Thr Ile Ser Ala Ser Arg
165 170

<210> 19
<211> 32
<212> PRT
<213> Rattus sp.

<220>

<221> VARIANT
<222> (3)
<223> Xaa at position 3 is Leu or Phe

<220>
<221> VARIANT
<222> (4)
<223> Xaa at position 4 is Ser or Thr or Asn

<220>
<221> VARIANT
<222> (6)
<223> Xaa at position 6 is Cys or Ser

<220>
<221> VARIANT
<222> (7)
<223> Xaa at position 7 is Ala or Thr

<220>
<221> VARIANT
<222> (8)
<223> Xaa at position 8 is Thr or Ala or Ser

<220>
<221> VARIANT
<222> (10)
<223> Xaa at position 10 is Leu or Met

<220>
<221> VARIANT
<222> (12)
<223> Xaa at position 12 is Ser or Asn or His

<220>
<221> VARIANT
<222> (13)
<223> Xaa at position 13 is Val or Ile

<220>
<221> VARIANT
<222> (14)
<223> Xaa at position 14 is Leu or Phe

<220>
<221> VARIANT
<222> (15)
<223> Xaa at position 15 is Gln or Trp

<220>
<221> VARIANT
<222> (16)
<223> Xaa at position 16 is Ala or Thr or Met

<220>
<221> VARIANT
<222> (17)
<223> Xaa at position 17 is Ile or Phe

<220>
<221> VARIANT
<222> (18)
<223> Xaa at position 18 is Ile or Thr

<220>
<221> VARIANT
<222> (21)
<223> Xaa at position 21 is Pro or Ser

<220>
<221> VARIANT
<222> (22)
<223> Xaa at position 22 is Arg or Lys

<220>
<221> VARIANT
<222> (23)
<223> Xaa at position 23 is Ser or Lys

<220>
<221> VARIANT
<222> (27)
<223> Xaa at position 27 is Ala or Thr

<220>
<221> VARIANT
<222> (28)
<223> Xaa at position 28 is Lys or Thr

<220>
<221> VARIANT
<222> (29)
<223> Xaa at position 29 is Phe or Tyr

<220>
<221> VARIANT

<222> (31)
<223> Xaa at position 31 is His or Tyr

<220>
<221> VARIANT
<222> (32)
<223> Xaa at position 32 is Lys or Asn

<400> 19
Arg Gly Xaa Xaa Leu Xaa Xaa Xaa Cys Xaa Leu Xaa Xaa Xaa Xaa Xaa
1 5 10 15

Xaa Xaa Leu Ser Xaa Xaa Xaa Ser Cys Leu Xaa Xaa Xaa Lys Xaa Xaa
20 25 30

<210> 20
<211> 21
<212> PRT
<213> Rattus sp.

<220>
<221> VARIANT
<222> (2)
<223> Xaa at position 2 is Ala or Ser or Val

<220>
<221> VARIANT
<222> (5)
<223> Xaa at position 5 is Glu or Gln

<220>
<221> VARIANT
<222> (10)
<223> Xaa at position 10 is Arg or Gln or Glu

<220>
<221> VARIANT
<222> (11)
<223> Xaa at position 11 is Thr or Ser

<220>
<221> VARIANT
<222> (13)
<223> Xaa at position 13 is Leu or Met

<220>
<221> VARIANT
<222> (14)
<223> Xaa at position 14 is Met or Leu or Ile

<220>
<221> VARIANT
<222> (16)
<223> Xaa at position 16 is Met or Arg

<220>
<221> VARIANT
<222> (17)
<223> Xaa at position 17 is Ser or Thr

<220>
<221> VARIANT
<222> (18)
<223> Xaa at position 18 is Phe or Leu

<220>
<221> VARIANT
<222> (20)
<223> Xaa at position 20 is Val or Gly

<220>
<221> VARIANT
<222> (21)
<223> Xaa at position 21 is Val or Leu

<400> 20

```
Lys Xaa Ser Pro Xaa Gln Arg Ala Thr Xaa Xaa Ile Xaa Xaa Leu Xaa
 1               5                  10                  15

Xaa Xaa Phe Xaa Xaa
            20
```

<210> 21
<211> 9
<212> PRT
<213> Rattus sp.

<220>
<223> Xaa at position 4 is Val or Ile or Leu, Xaa at position 6 is Pro or Ser, Xaa at position 7 is Phe or Leu, Xaa at position 8 is Val or Leu, Xaa at

position 9 is Phe or Leu

<220>
<221> VARIANT
<222> (4)
<223> Xaa at position 4 is Val or Ile or Leu

<220>
<221> VARIANT
<222> (6)
<223> Xaa at position 6 is Pro or Ser

<220>
<221> VARIANT
<222> (7)
<223> Xaa at position 7 is Phe or Leu

<220>
<221> VARIANT
<222> (8)
<223> Xaa at position 8 is Val or Leu

<220>
<221> VARIANT
<222> (9)
<223> Xaa at position 9 is Phe or Leu

<400> 21
Tyr Ala Thr Xaa Ser Xaa Xaa Xaa Xaa
1 5